March 12, 2013

Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
11201 Renner Blvd.
Lenexa, KS 66219

Re: The Doe Run Company – Elvins/Rivermines Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 56 of the Unilateral Administrative Order (UAO) (CERCLA-07-2005-0169) for the referenced project and on behalf of The Doe Run Company, the progress report for the period February 1, 2013 through February 28, 2013 is enclosed. If you have any questions or comments, please call me at 573-638-5020 or Mark Nations at 573-518-0800.

Sincerely,

Ty L. Morris, P.E., R.G.
Vice President

TLM/jms
Enclosures
c: Mark Nations – TDRC
Matt Wohl – TDRC (electronic only)
Mark Yingling – TDRC (electronic only)
Kathy Rangen – MDNR
Tim Skoglund – Barr Engineering

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Elvins/Rivermines Mine Tailings Site
Park Hills, Missouri
Removal Action - Monthly Progress Report
Period: February 1, 2013 – February 28, 2013

1. **Actions Performed and Problems Encountered This Period:**

   a. Continued operating the roughing filter during the period. Flow was diverted around the ZVI/sand filter, aeration tank, and final sand filter until February 21, 2013 when flow through those portions of the pilot test was resumed.

   b. Completed renovations to the ZVI/sand filter, aeration tank, and final sand filter between February 18, 2013, and February 21, 2013. Renovations to the ZVI/sand filter included: replacing the tank contents with a stratified media that included a layer of sand, a layer of pea rock, and a layer of mulch mixed with sand and pea gravel; installing several pieces of rebar vertically through the sand and pea rock layers; and adding baffles to increase contact time. The round tank is again serving as an aeration basin/settling tank and sand was replaced in the final sand filter.

   c. Continued to take analytical samples from the pilot test two to three times a week. Samples were taken from the roughing filter (RMP-Rough) through bypass pipe except for the sampling events on February 25, 2013, and February 27, 2013, when the sample was taken through the syphon hose. Following the renovations to the ZVI/sand filter, aeration tank, and final sand filter, samples were also taken from the ZVI/sand filter effluent, and final sand filter effluent.

   d. Continued to take analytical samples from the seep pond effluent and the western treatment pond effluent to monitor the metals reduction of the treatment pond.

   e. Vandalism occurred at the pilot test twice during the period. Once on February 6, 2013 and again on February 22, 2013. The pipe going into the pilot test was damaged. In both instances flow was temporarily interrupted but restored.

   f. Work continued on the task of rehabilitating the western treatment pond. This work focused on allowing the saturated media to activate. As part of the media activation process, the flow has been progressively increased and is now at full capacity. Analytical results of samples taken from the seep and western treatment pond indicate that metals reduction is occurring.

2. **Analytical Data and Results Received This Period:**

   a. Dissolved zinc concentrations in the pilot test effluent ranged between 7.19 mg/L and 11.42 mg/L prior to the renovations. Dissolved zinc concentrations in the pilot test effluent ranged between 6.55 mg/L and 10.42 mg/L after the renovations were completed.

   b. Total zinc concentrations in the pilot test effluent ranged between 8.18 mg/L and 12.21 mg/L prior to the renovations. Total zinc concentrations in the pilot effluent ranged between 6.63 mg/L and 10.25 mg/L after the renovations were completed.

   c. Total iron concentrations in the pilot test effluent ranged between 1.16 mg/L and 1.52 mg/L prior to the renovations. Total iron concentrations in the pilot effluent ranged between 0.25 mg/L and 0.41 mg/L after the renovations were completed.

   d. Total suspended solids concentrations in the pilot test effluent ranged between 9.0 mg/L and 31.0 mg/L after the renovations were completed. Samples were not evaluated for suspended solids prior to the renovations.

   e. Dissolved zinc and total zinc concentrations in the seep pond effluent were measured at 21.2 mg/L and 22.6 mg/L. Dissolved zinc and total zinc concentrations in the western treatment pond effluent were measured at 4.99 mg/L and 7.53 mg/L respectively.

f. During this period, water samples were collected from just upstream of Old Missouri Highway 32, as well as from upstream and downstream of the confluence of the site discharge with Flat River. The analytical results for this event are included in this progress report.

g. During this period, the Ambient Air Monitoring Reports for Third Quarter 2012, October 2012, and November 2012 were completed. Any issues identified in these reports are discussed below. A copy of these documents has been sent to your attention.

The Third Quarter 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No samples were taken with the Rivermines #3 (Water Treatment Plant) TSP monitor on 07/02/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the TSP monitors on 07/04/12 due to the holiday.
- A QA filter blank was completed on the Rivermines #1 (Office) TSP and PM_{10} monitors on 08/30/12.
- No samples were taken with the TSP and PM_{10} monitors on 09/03/12 due to the holiday.
- No samples were taken with the Big River #4 (Primary) PM_{10} monitor on 09/21/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the Rivermines #1 (Office) TSP and PM_{10} monitors on 09/27/12 due to electrical issues caused by the weather. Upon discovery, these issues were corrected.
- There was a QA blank filter associated with the Rivermines #2 (North) TSP and PM_{10} monitors on 09/28/12.

The October 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No sample was taken with the Big River #4 (Primary) PM_{10} monitor on 10/09/12 due to mechanical failure of the elapsed time indicator. Upon discovery, the issue was corrected.

The November 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No sample was taken with the Big River #4 (Primary) TSP monitor on 11/02/12 due to the filter being compromised by moisture during a storm event. Upon discovery, the issue was corrected.
- The sample for Big River #4 (QA) PM_{10} monitor was invalid on 11/05/12 due to the elapsed run time being outside of the tolerances. Upon identifying the issue, timer and sampling procedures were evaluated and the issue was corrected.
- The sample for Rivermines #1 (Office) TSP monitor was invalid on 11/15/12 due to the elapsed run time being outside of the tolerances. Upon identifying the issue, timer and sampling procedures were evaluated and the issue was corrected.
- No samples were taken with the TSP and PM_{10} monitors on 11/21/12, 11/22/12, and 11/23/12 due to the holiday.
- A QA filter blank was completed on the Rivermines #3 (Water Treatment Plant) TSP and PM_{10} monitors on 11/27/12.

3. Developments Anticipated and Work Scheduled for Next Period:

a. Continue analytical sampling and field measurements three times a week. No WET tests are planned.

b. Continue monthly analytical sampling and field measurements from the seep pond and western treatment pond.

c. Continue to operate the renovated pilot test.

d. Complete monthly water sampling activities as described in the Removal Action Work Plan.

e. Complete air monitoring activities as described in the Removal Action Work Plan.

f. Continue monitoring the western treatment pond to see that the hydraulics are working properly and evaluate the metals reduction as the pond continues to come online.

4. Changes in Personnel:

a. None.

5. Issues or Problems Arising This Period:

a. None.

6. Resolution of Issues or Problems Arising This Period:

a. None.

End of Monthly Progress Report

February 20, 2013

Allison Olds
Barr Engineering Company
1001 Diamond Ridge
Suite 1100
Jefferson City, MO 65109
TEL: (573) 638-5007
FAX: (573) 638-5001

RE: Rivermines NPDES **WorkOrder:** 13020614

Dear Allison Olds:

TEKLAB, INC received 4 samples on 2/13/2013 12:25:00 PM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Michael L. Austin
Project Manager
(618)344-1004 ex 16
MAustin@teklabinc.com

Report Contents

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13

This reporting package includes the following:

Client: Barr Engineering Company
Work Order: 13020614

Client Project: Rivermines NPDES
Report Date: 20-Feb-13

Abbr Definition

CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
DNI	Did not ignite
DUP	Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MB	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TNTC	Too numerous to count (> 200 CFU)

Qualifiers

# - Unknown hydrocarbon	B - Analyte detected in associated Method Blank
E - Value above quantitation range	H - Holding times exceeded
J - Analyte detected below quantitation limits	M - Manual Integration used to determine area response
ND - Not Detected at the Reporting Limit	R - RPD outside accepted recovery limits
S - Spike Recovery outside recovery limits	X - Value exceeds Maximum Contaminant Level

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

Cooler Receipt Temp: 3.4 °C

Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	KKlostermann@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2014	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2014	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2013	Collinsville
Arkansas	ADEQ	88-0966		3/14/2013	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		5/26/2013	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2013	Collinsville

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13
Lab ID: 13020614-001
Client Sample ID: RM-001
Matrix: AQUEOUS
Collection Date: 02/12/2013 12:55

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	500		**876**	mg/L	50	02/14/2013 17:44	R173751
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**6.89**		1	02/14/2013 7:34	R173701
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**1020**	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**9**	mg/L	1	02/13/2013 20:22	R173699
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.2		**< 0.2**	ml/L	2	02/13/2013 19:00	R173675
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**9.8**	mg/L	1	02/18/2013 18:19	R173874
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 14:01	85755
Zinc	NELAP	10.0	S	**4990**	µg/L	1	02/15/2013 14:01	85755
MS QC limits for Zn are not applicable due to high sample/spike ratio.								
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 19:15	85748
Zinc	NELAP	10.0		**7050**	µg/L	1	02/15/2013 19:15	85748
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 8:53	85762
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 9:44	85807

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13
Lab ID: 13020614-002
Client Sample ID: RM-US
Matrix: AQUEOUS
Collection Date: 02/12/2013 13:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		**26**	mg/L	1	02/14/2013 17:47	R173751
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**8.18**		1	02/14/2013 7:36	R173701
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**130**	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	02/13/2013 20:22	R173699
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**2.7**	mg/L	1	02/18/2013 18:26	R173874
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 14:20	85755
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	02/15/2013 14:20	85755
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 19:26	85748
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	02/15/2013 19:26	85748
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 8:56	85762
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 9:48	85807

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13
Lab ID: 13020614-003
Client Sample ID: RM-DS
Matrix: AQUEOUS
Collection Date: 02/12/2013 12:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	50	S	**57**	mg/L	5	02/14/2013 18:03	R173751
Matrix interference present in sample.								
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.94**		1	02/14/2013 7:37	R173701
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**200**	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	02/13/2013 20:32	R173699
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**2.9**	mg/L	1	02/18/2013 18:32	R173874
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 14:24	85755
Zinc	NELAP	10.0		**142**	µg/L	1	02/15/2013 14:24	85755
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 19:30	85748
Zinc	NELAP	10.0		**178**	µg/L	1	02/15/2013 19:30	85748
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 9:07	85762
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 9:58	85807

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13
Lab ID: 13020614-004
Client Sample ID: RM-DUP
Matrix: AQUEOUS
Collection Date: 02/12/2013 0:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	500		**966**	mg/L	50	02/14/2013 18:22	R173751
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**6.93**		1	02/14/2013 7:39	R173701
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**1010**	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**11**	mg/L	1	02/13/2013 20:32	R173699
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.2		**< 0.2**	ml/L	2	02/13/2013 19:00	R173675
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**9.8**	mg/L	1	02/18/2013 18:58	R173874
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 14:28	85755
Zinc	NELAP	10.0		**5080**	µg/L	1	02/15/2013 14:28	85755
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	02/15/2013 19:33	85748
Zinc	NELAP	10.0		**7040**	µg/L	1	02/15/2013 19:33	85748
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 9:10	85762
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	02/18/2013 10:08	85807

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
13020614-001	RM-001	Aqueous	5	02/12/2013 12:55
13020614-002	RM-US	Aqueous	5	02/12/2013 13:50
13020614-003	RM-DS	Aqueous	5	02/12/2013 12:00
13020614-004	RM-DUP	Aqueous	5	02/12/2013 0:00

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

Sample ID	Client Sample ID / Test Name	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
13020614-001A	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	Standard Methods 2540 D				02/13/2013 20:22
	Standard Methods 2540 F				02/13/2013 19:00
13020614-001B	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	EPA 600 375.2 Rev 2.0 1993 (Total)				02/14/2013 17:44
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:34
	Standard Methods 2340 C				02/13/2013 15:00
13020614-001C	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			02/14/2013 14:19	02/15/2013 19:15
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 8:53
13020614-001D	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			02/14/2013 16:50	02/15/2013 14:01
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			02/17/2013 15:48	02/18/2013 9:44
13020614-001E	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	Standard Methods 5310 C, Organic Carbon				02/18/2013 18:19
13020614-002A	RM-US	02/12/2013 13:50	02/13/2013 12:25		
	Standard Methods 2540 D				02/13/2013 20:22
13020614-002B	RM-US	02/12/2013 13:50	02/13/2013 12:25		
	EPA 600 375.2 Rev 2.0 1993 (Total)				02/14/2013 17:47
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:36
	Standard Methods 2340 C				02/13/2013 15:00
13020614-002C	RM-US	02/12/2013 13:50	02/13/2013 12:25		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			02/14/2013 14:19	02/15/2013 19:26
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 8:56
13020614-002D	RM-US	02/12/2013 13:50	02/13/2013 12:25		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			02/14/2013 16:50	02/15/2013 14:20
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			02/17/2013 15:48	02/18/2013 9:48
13020614-002E	RM-US	02/12/2013 13:50	02/13/2013 12:25		
	Standard Methods 5310 C, Organic Carbon				02/18/2013 18:26
13020614-003A	RM-DS	02/12/2013 12:00	02/13/2013 12:25		
	Standard Methods 2540 D				02/13/2013 20:32
13020614-003B	RM-DS	02/12/2013 12:00	02/13/2013 12:25		
	EPA 600 375.2 Rev 2.0 1993 (Total)				02/14/2013 18:03
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:37
	Standard Methods 2340 C				02/13/2013 15:00
13020614-003C	RM-DS	02/12/2013 12:00	02/13/2013 12:25		

Client: Barr Engineering Company
Client Project: Rivermines NPDES

Work Order: 13020614
Report Date: 20-Feb-13

Sample ID	Client Sample ID / Test Name	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			02/14/2013 14:19	02/15/2013 19:30
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 9:07
13020614-003D	RM-DS	02/12/2013 12:00	02/13/2013 12:25		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			02/14/2013 16:50	02/15/2013 14:24
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			02/17/2013 15:48	02/18/2013 9:58
13020614-003E	RM-DS	02/12/2013 12:00	02/13/2013 12:25		
	Standard Methods 5310 C, Organic Carbon				02/18/2013 18:32
13020614-004A	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	Standard Methods 2540 D				02/13/2013 20:32
	Standard Methods 2540 F				02/13/2013 19:00
13020614-004B	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	EPA 600 375.2 Rev 2.0 1993 (Total)				02/14/2013 18:22
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:39
	Standard Methods 2340 C				02/13/2013 15:00
13020614-004C	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			02/14/2013 14:19	02/15/2013 19:33
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 9:10
13020614-004D	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			02/14/2013 16:50	02/15/2013 14:28
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			02/17/2013 15:48	02/18/2013 10:08
13020614-004E	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	Standard Methods 5310 C, Organic Carbon				02/18/2013 18:58

Client: Barr Engineering Company

Client Project: Rivermines NPDES

Work Order: 13020614

Report Date: 20-Feb-13

EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch R173751 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**< 10**						02/14/2013

Batch R173751 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**22**	20	0	109.0	90	110	02/14/2013

Batch R173751 **SampType:** MS Units **mg/L**
SampID: 13020614-003BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	50	S	**94**	50	56.76	75.2	90	110	02/14/2013

Batch R173751 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 13020614-003BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate	50	S	**97**	50	56.76	81.1	94.34	3.11	02/14/2013

Batch R173826 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**< 10**						02/15/2013

Batch R173826 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**21**	20	0	107.0	90	110	02/15/2013

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R173701 **SampType:** LCS Units
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH	1.00		**7.03**	7.00	0	100.4	99.1	100.8	02/14/2013

Batch R173701 **SampType:** DUP Units RPD Limit **10**
SampID: 13020614-001BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**6.91**				6.890	0.29	02/14/2013

Client: Barr Engineering Company

Client Project: Rivermines NPDES

Work Order: 13020614

Report Date: 20-Feb-13

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R173701 **SampType:** DUP Units RPD Limit **10**
SampID: 13020614-002BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**8.16**				8.180	0.24	02/14/2013

Batch R173701 **SampType:** DUP Units RPD Limit **10**
SampID: 13020614-003BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.94**				7.940	0.00	02/14/2013

Batch R173701 **SampType:** DUP Units RPD Limit **10**
SampID: 13020614-004BDUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**6.92**				6.930	0.14	02/14/2013

STANDARD METHODS 2340 C

Batch R173667 **SampType:** MBLK Units **mg/L**
SampID: MB-R173667

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**< 5**						02/13/2013

Batch R173667 **SampType:** LCS Units **mg/L**
SampID: LCS-R173667

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**1020**	1000	0	102.0	90	110	02/13/2013

Batch R173667 **SampType:** MS Units **mg/L**
SampID: 13020614-001BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**1240**	200	1020	110.0	85	115	02/13/2013

Batch R173667 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 13020614-001BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Hardness, as (CaCO3)	5		**1230**	200	1020	105.0	1240	0.81	02/13/2013

STANDARD METHODS 2540 D

Batch R173699 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**< 6**						02/13/2013

Client: Barr Engineering Company
Client Project: Rivermines NPDES

Work Order: 13020614
Report Date: 20-Feb-13

STANDARD METHODS 2540 D

Batch R173699 **SampType:** LCS Units mg/L
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**98**	100	0	98.0	85	115	02/13/2013
Total Suspended Solids	6		**97**	100	0	97.0	85	115	02/13/2013
Total Suspended Solids	6		**95**	100	0	95.0	85	115	02/13/2013
Total Suspended Solids	6		**93**	100	0	93.0	85	115	02/13/2013
Total Suspended Solids	6		**107**	100	0	107.0	85	115	02/13/2013

Batch R173699 **SampType:** DUP Units mg/L RPD Limit **15**
SampID: 13020614-002A DUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Suspended Solids	6		**< 6**				0	0.00	02/13/2013

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R173874 **SampType:** MBLK Units mg/L
SampID: ICB/MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**< 1.0**						02/18/2013

Batch R173874 **SampType:** LCS Units mg/L
SampID: ICV/LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	10.0		**62.4**	59.7	0	104.6	90	110	02/18/2013

Batch R173874 **SampType:** MS Units mg/L
SampID: 13020614-003EMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**7.6**	5.0	2.910	93.0	85	115	02/18/2013

Batch R173874 **SampType:** MSD Units mg/L RPD Limit **10**
SampID: 13020614-003EMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Organic Carbon (TOC)	1.0		**7.8**	5.0	2.910	97.0	7.560	2.61	02/18/2013

EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch 85755 **SampType:** MBLK Units µg/L
SampID: MB-85755

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	02/15/2013
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	02/15/2013

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13

EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch 85755 **SampType:** LCS Units µg/L
SampID: LCS-85755

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**45.8**	50.0	0	91.6	85	115	02/15/2013
Zinc	10.0		**460**	500	0	91.9	85	115	02/15/2013

Batch 85755 **SampType:** MS Units µg/L
SampID: 13020614-001DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**44.2**	50.0	0	88.4	75	125	02/15/2013
Zinc	10.0	S	**5250**	500	4990	52.6	75	125	02/15/2013

Batch 85755 **SampType:** MSD Units µg/L RPD Limit **20**
SampID: 13020614-001DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**45.3**	50.0	0	90.6	44.2	2.46	02/15/2013
Zinc	10.0	S	**5330**	500	4990	68.2	5253	1.47	02/15/2013

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 85748 **SampType:** MBLK Units µg/L
SampID: MB-85748

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	02/15/2013
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	02/15/2013

Batch 85748 **SampType:** LCS Units µg/L
SampID: LCS-85748

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**49.4**	50.0	0	98.8	85	115	02/15/2013
Zinc	10.0		**494**	500	0	98.9	85	115	02/15/2013

Batch 85748 **SampType:** MS Units µg/L
SampID: 13020614-001CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**49.9**	50.0	1	97.8	75	125	02/15/2013
Zinc	10.0		**7550**	500	7050	99.8	75	125	02/15/2013

Batch 85748 **SampType:** MSD Units µg/L RPD Limit **20**
SampID: 13020614-001CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**49.3**	50.0	1	96.6	49.9	1.21	02/15/2013
Zinc	10.0		**7500**	500	7050	89.0	7549	0.72	02/15/2013

Client: Barr Engineering Company

Client Project: Rivermines NPDES

Work Order: 13020614

Report Date: 20-Feb-13

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch 85762 **SampType:** MBLK Units µg/L

SampID: MB-85762

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	02/18/2013

Batch 85762 **SampType:** LCS Units µg/L

SampID: LCS-85762

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**14.1**	15.0	0	93.7	85	115	02/18/2013

Batch 85762 **SampType:** MS Units µg/L

SampID: 13020614-002CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**15.0**	15.0	0.6836	95.4	70	130	02/18/2013

Batch 85762 **SampType:** MSD Units µg/L RPD Limit **20**

SampID: 13020614-002CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		**14.9**	15.0	0.6836	95.1	14.9896	0.31	02/18/2013

STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 85807 **SampType:** MBLK Units µg/L

SampID: MB-85807

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	02/18/2013

Batch 85807 **SampType:** LCS Units µg/L

SampID: LCS-85807

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**13.8**	15.0	0	92.0	85	115	02/18/2013

Batch 85807 **SampType:** MS Units µg/L

SampID: 13020614-002DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**14.8**	15.0	0	98.9	70	130	02/18/2013

Batch 85807 **SampType:** MSD Units µg/L RPD Limit **20**

SampID: 13020614-002DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		**15.7**	15.0	0	104.5	14.8397	5.45	02/18/2013

Teklab, Inc.
Environmental Laboratory

Receiving Check List

http://www.teklabinc.com/

Client: Barr Engineering Company
Work Order: 13020614
Client Project: Rivermines NPDES
Report Date: 20-Feb-13

Carrier: Rich Mannz
Received By: TWM

Completed by: Emily E. Pohlman
On: 13-Feb-13

Reviewed by: Michael L. Austin
On: 13-Feb-13

Pages to follow: Chain of custody [1] Extra pages included [0]

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C	3.4	
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice	☐	
Chain of custody present?	Yes ☑	No ☐				
Chain of custody signed when relinquished and received?	Yes ☑	No ☐				
Chain of custody agrees with sample labels?	Yes ☑	No ☐				
Samples in proper container/bottle?	Yes ☑	No ☐				
Sample containers intact?	Yes ☑	No ☐				
Sufficient sample volume for indicated test?	Yes ☑	No ☐				
All samples received within holding time?	Yes ☑	No ☐				
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐			
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐				
When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.						
Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑			
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑			
Water - pH acceptable upon receipt?	Yes ☑	No ☐				
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑			

Any No responses must be detailed below or on the COC.

Custody seal(s) intact on shipping container/cooler. EEP 2/13/13.

1302614

Chain of Custody

BARR
1001 Diamond Ridge, Suite 1100
Jefferson City, MO 65109
(573) 638-5000

Project Number: 25860009.00 TLM 021

Project Name: Rivermines NPDES

Sample Origination State: MO (use two letter postal state abbreviation)

COC Number: RMP 021213

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Matrix:	Type: Grab	Type: Comp	Type: QC	Parameters: Water: pH	Total Suspended Solids	Sulfate	Settleable Solids	Total Organic Carbon	Total Metals	Dissolved Metals	Hardness			Parameters: Soil: VOCs (tared MeOH) #1	GRO, BTE (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)			Total Number of Containers	Preservatives
1. RM-001 -001 (1302614)				02/12/13	12:55	X			X			X	X	X	X	X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
2. RM-US -002				02/12/13	13:50	X			X			X	X	X		X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
3. RM-DS -003				02/12/13	12:00	X			X			X	X	X		X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
4. RM-DUP -004				02/12/13	--:--	X			X			X	X	X	X	X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
5.																														
6.																														
7.																														
8.																														

COC 1 of 1

Project Manager: Ty Morris

Project QC Contact: Andrea Nord

Sampled By: Stephen Moilanen

Laboratory: Teklab

Comments: Invoice to Mark Nations at Doe Run. Results to be sent to Allison Olds (aolds@barr.com) at Barr Engineering, Andrea Nord (anord@barr.com) at Barr Engineering, and Mark Nations (mnations@doerun.com) at Doe Run.
Matrix is surface water.
Metals include Cadmium, Lead, and Zinc.

3.4

Common Parameter/Container – Preservation Key

#1 – Volatile Organics = BTEX, GRO, TPH, 8260 Full List

#2 – Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide, PCBs

#3 – General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate

#4 – Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: Stephen Moilanen	On Ice? ☒Y ☐N	Date: 2-12-13	Time: 16:00	Received by:	Date: 2/13/2013	Time: 10:35
Relinquished By:	On Ice? ☒Y ☐N	Date: 2-13-13	Time: 1225	Received by:	Date: 2-13-13	Time: 1225

Samples Shipped VIA: ☐Air Freight ☐Federal Express ☐Sampler ☒Other: Courier

Air Bill Number: Yes / 2-13-13

Distribution: White – Original Accompanies Shipment to Lab; Yellow – Field Copy; Pink – Lab Coordinator

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	pH mg/l	Turbidity FAU
2/1/13	13-0678	RMP ROUGH T	3.3	8182^	2.6	0.19 J	674	22	1158	194	791	7.22	0
		RMP ROUGH D		7913^					1063				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0678

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/5/13	
Copper	ug/L	ND	0.97	2/5/13	
Lead	ug/L	0.28	2.7	2/5/13	
Zinc	ug/L	ND	0.91	2/5/13	
Nickel	ug/L	0.17	0.86	2/5/13	
Thallium	ug/L	ND	1.86	2/5/13	
Iron	ug/L	ND	2.0	2/5/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	481	96%	85-115%	
Copper	ug/L	500	500	100%	85-115%	
Lead	ug/L	500	487	97%	85-115%	
Zinc	ug/L	500	477	95%	85-115%	
Nickel	ug/L	500	489	98%	85-115%	
Iron	ug/L	500	479	96%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0678 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	546	544	109%	109%	75-125%	
Copper	ug/L	0	500	500	497	498	99%	100%	75-125%	
Lead	ug/L	0.03	500	500	497	496	99%	99%	75-125%	
Zinc	ug/L	82	500	500	647	644	113%	112%	75-125%	
Nickel	ug/L	8.6	500	500	504	500	99%	98%	75-125%	
Iron	ug/L	4.1	500	500	482	486	96%	96%	75-125%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-0678

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	0.54	5	2/6/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	103.6	104%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.7	105%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-0678

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	193.7	194.2	100%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.01	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.05	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.96	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	9.97	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.05	3.95-4.05	L12-0002-0048
Slope	99.5%	90-102%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
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(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-0678

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/1/13	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-0678	mg/l	7.9	4	11.3	85%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.4	88%	85-115	

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(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	2/6/2013
Manager	Date
EJS	2/6/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	pH mg/l	Turbidity FAU
2/4/13	13-0706	RMP ROUGH T	3.3	8687^	5.4	ND	713	25	1301	191	789	7.07	0
		RMP ROUGH D		8029^					1208				
RL			2.7	0.91	0.97	0.38	0.86	1.4	2				
MDL			0.85	0.28	0.3	0.12	0.27	0.58	0.34				

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43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0706

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/5/13	
Copper	ug/L	0.59	0.97	2/5/13	
Lead	ug/L	0.18	2.7	2/5/13	
Zinc	ug/L	ND	0.91	2/5/13	
Nickel	ug/L	ND	0.86	2/5/13	
Thallium	ug/L	0.46	1.86	2/5/13	
Iron	ug/L	4.9	2.0	2/5/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	502	100%	85-115%	
Copper	ug/L	500	500	100%	85-115%	
Lead	ug/L	500	500	100%	85-115%	
Zinc	ug/L	500	503	101%	85-115%	
Nickel	ug/L	500	501	100%	85-115%	
Iron	ug/L	500	512	102%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0706 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	555	546	111%	109%	75-125%	
Copper	ug/L	2.8	500	500	497	488	99%	97%	75-125%	
Lead	ug/L	0.78	500	500	501	496	100%	99%	75-125%	
Zinc	ug/L	87	500	500	659	649	114%	112%	75-125%	
Nickel	ug/L	8.8	500	500	507	500	100%	98%	75-125%	
Iron	ug/L	8.8	500	500	510	526	100%	103%	75-125%	

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(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-0706

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	0.54	5	2/6/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	103.6	104%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.7	105%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-0706

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	190.9	190.9	100%	85-115%	

pH SM4500-H+I	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.01	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	4.05	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.96	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	9.97	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4.05	3.95-4.05	L12-0002-0048
Slope	99.5%	90-102%	

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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-0706

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/4/13	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-0706	mg/l	7.9	4	11.5	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.9	98%	85-115	

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QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	2/6/2013
Manager	Date
EJS	2/6/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	pH mg/l	Turbidity FAU
2/11/13	13-0839	RMP ROUGH T	3.6	12210^	3.3	ND	1061	23	1467	159	788	7.11	6
		RMP ROUGH D		11380^					1468***				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0839

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/13/13	
Copper	ug/L	1.7	0.97	2/13/13	
Lead	ug/L	ND	2.7	2/13/13	
Zinc	ug/L	0.16	0.91	2/13/13	
Nickel	ug/L	ND	0.86	2/13/13	
Thallium	ug/L	0.09	1.86	2/13/13	
Iron	ug/L	ND	2.0	2/13/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	494	99%	85-115%	
Copper	ug/L	500	512	102%	85-115%	
Lead	ug/L	500	493	99%	85-115%	
Zinc	ug/L	500	501	100%	85-115%	
Nickel	ug/L	500	491	98%	85-115%	
Iron	ug/L	500	466	93%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0839 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	586	568	117%	114%	75-125%	
Copper	ug/L	0	500	500	466	445	93%	89%	75-125%	
Lead	ug/L	0.38	500	500	514	497	103%	99%	75-125%	
Zinc	ug/L	122	500	500	740	713	124%	118%	75-125%	
Nickel	ug/L	14	500	500	518	499	101%	97%	75-125%	
Iron	ug/L	14	500	500	566	547	110%	107%	75-125%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-0839

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	0.4	5	2/13/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	93.8	94%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	96.3	96%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-0839

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	158.5	159	100%	85-115%	

pH SM4500-H+I	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.96	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	3.99	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	10.05	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4	3.95-4.05	L12-0002-0048
Slope	93.4%	90-102%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-0839

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/11/12	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-0839	mg/l	7.8	4	11.3	88%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.3	86%	85-115	

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Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	2/18/2013
Manager	Date
EJS	2/18/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	pH mg/l	Turbidity FAU
2/13/13	13-0929	RMP ROUGH T	2.8	10680^	1.6	ND	816	25	1520	159	752	7.03	6
		RMP ROUGH D		10930^***					1414				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0929

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.02	0.38	2/14/13	
Copper	ug/L	1.0	0.97	2/14/13	
Lead	ug/L	ND	2.7	2/14/13	
Zinc	ug/L	0.14	0.91	2/14/13	
Nickel	ug/L	ND	0.86	2/14/13	
Thallium	ug/L	ND	1.86	2/14/13	
Iron	ug/L	ND	2.0	2/14/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	521	104%	85-115%	
Copper	ug/L	500	509	102%	85-115%	
Lead	ug/L	500	522	104%	85-115%	
Zinc	ug/L	500	520	104%	85-115%	
Nickel	ug/L	500	520	104%	85-115%	
Iron	ug/L	500	514	103%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0929 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	581	565	116%	113%	75-125%	
Copper	ug/L	0.83	500	500	440	424	88%	85%	75-125%	
Lead	ug/L	0	500	500	516	503	103%	101%	75-125%	
Zinc	ug/L	107	500	500	711	692	121%	117%	75-125%	
Nickel	ug/L	10	500	500	521	508	102%	100%	75-125%	
Iron	ug/L	5.2	500	500	521	498	103%	99%	75-125%	

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Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-0929

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	0.4	5	2/13/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	93.8	94%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	96.3	96%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-0929

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	158.5	167	105%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	6.96	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	3.99	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.98	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	10.05	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	4	3.95-4.05	L12-0002-0048
Slope	93.4%	90-102%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-0929

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/15/13	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-0929	mg/l	7.52	4	11.6	102%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.8	96%	85-115	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	2/22/2013
Manager	Date
EJS	2/22/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	pH mg/l	Turbidity FAU
2/15/13	13-0956	RMP ROUGH T	ND	10820^	3.4	0.15J	814	28	1451	143	808	7.36	0
		RMP ROUGH D		11420^***					1433				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0956

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.03	0.38	2/15/13	
Copper	ug/L	2.7	0.97	2/15/13	
Lead	ug/L	ND	2.7	2/15/13	
Zinc	ug/L	ND	0.91	2/15/13	
Nickel	ug/L	ND	0.86	2/15/13	
Thallium	ug/L	1.8	1.86	2/15/13	
Iron	ug/L	8.6	2.0	2/15/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	520	104%	85-115%	
Copper	ug/L	500	519	104%	85-115%	
Lead	ug/L	500	520	104%	85-115%	
Zinc	ug/L	500	521	104%	85-115%	
Nickel	ug/L	500	519	104%	85-115%	
Iron	ug/L	500	522	104%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0956 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	584	589	117%	118%	75-125%	
Copper	ug/L	0	500	500	465	463	93%	93%	75-125%	
Lead	ug/L	0	500	500	523	525	105%	105%	75-125%	
Zinc	ug/L	108	500	500	721	726	123%	124%	75-125%	
Nickel	ug/L	10	500	500	531	531	104%	104%	75-125%	
Iron	ug/L	4.7	500	500	597	550	118%	109%	75-125%	

The DOE RUN Company

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43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-0956

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	2.28	5	2/21/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.1	104%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	102.6	103%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-0956

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	142.8	144.8	101%	85-115%	

pH SM4500-H+I	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.00	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	3.97	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.96	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	9.97	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	3.95	3.95-4.05	L12-0002-0048
Slope	97.2%	90-102%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-0956

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/15/13	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-0956	mg/l	8.1	4	11.3	80%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	4	4.2	105%	85-115	

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43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	2/22/2013
Manager	Date
EJS	2/22/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	pH mg/l	Turbidity FAU
2/18/13	13-0987	RMP ROUGH T	3.3	8959^	1.8	ND	824	27	1326	164	786	7.15	8
		RMP ROUGH D		8457^					1263				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0987

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/20/13	
Copper	ug/L	ND	0.97	2/20/13	
Lead	ug/L	0.08	2.7	2/20/13	
Zinc	ug/L	0.99	0.91	2/20/13	
Nickel	ug/L	ND	0.86	2/20/13	
Thallium	ug/L	ND	1.86	2/20/13	
Iron	ug/L	ND	2.0	2/20/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	495	99%	85-115%	
Copper	ug/L	500	487	97%	85-115%	
Lead	ug/L	500	490	98%	85-115%	
Zinc	ug/L	500	492	98%	85-115%	
Nickel	ug/L	500	488	98%	85-115%	
Iron	ug/L	500	480	96%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0987 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.04	500	500	478	482	96%	96%	75-125%	
Copper	ug/L	0	500	500	484	491	97%	98%	75-125%	
Lead	ug/L	0.57	500	500	479	482	96%	96%	75-125%	
Zinc	ug/L	90	500	500	562	606	94%	103%	75-125%	
Nickel	ug/L	9.4	500	500	473	476	93%	93%	75-125%	
Iron	ug/L	0	500	500	420	433	84%	87%	75-125%	

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Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity 7.15

METHOD BLANK

Associated Lab Samples: L13-0001-0987

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	2.28	5	2/21/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.1	104%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	102.6	103%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-0987

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	163.6	165.1	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.00	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	3.97	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.96	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	9.97	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	3.95	3.95-4.05	L12-0002-0048
Slope	97.2%	90-102%	

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43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0 7.15

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-0987

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/20-13	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-0987	mg/l	7.9	4	11.8	98%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	4	4.1	103%	85-115	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	2/22/2013
Manager	Date
EJS	2/22/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	pH mg/l	Turbidity FAU
2/20/13	13-1088	RMP ROUGH T	2.8	11490^	1.0	ND	818	23	1202	171	821	7.4	0
		RMP ROUGH D		11100^					1068				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-1088

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.10	0.38	2/21/13	
Copper	ug/L	ND	0.97	2/21/13	
Lead	ug/L	ND	2.7	2/21/13	
Zinc	ug/L	0.27	0.91	2/21/13	
Nickel	ug/L	0.11	0.86	2/21/13	
Thallium	ug/L	0.42	1.86	2/21/13	
Iron	ug/L	ND	2.0	2/21/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	502	100%	85-115%	
Copper	ug/L	500	506	101%	85-115%	
Lead	ug/L	500	501	100%	85-115%	
Zinc	ug/L	500	503	101%	85-115%	
Nickel	ug/L	500	504	101%	85-115%	
Iron	ug/L	500	489	98%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-1088 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	566	557	113%	111%	75-125%	
Copper	ug/L	0	500	500	432	423	86%	85%	75-125%	
Lead	ug/L	0	500	500	509	500	102%	100%	75-125%	
Zinc	ug/L	115	500	500	693	683	116%	114%	75-125%	
Nickel	ug/L	11	500	500	502	497	98%	97%	75-125%	
Iron	ug/L	1.2	500	500	451	455	90%	91%	75-125%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-1088

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	2.28	5	2/21/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.1	104%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	102.6	103%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-1088

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	170.6	169.6	99%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.00	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	3.97	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	9.96	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	9.97	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	3.95	3.95-4.05	L12-0002-0048
Slope	97.2%	90-102%	

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Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-1088

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/20/13	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-1088	mg/l	8.2	1.5	9.4	80%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.4	88%	85-115	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	2/22/2013
Manager	Date
EJS	2/22/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	P mg/l	TSS mg/l	pH mg/l	Turbidity FAU
2/25/13	13-1139	RMP ROUGH T	2.2 J	8097^	ND	ND	859	27	2215	176	774			6.98	7
		RMP ROUGH D		8221^***					1977						
2/25/13	13-1140	RMP POLISH T	2.7	5662^	ND	0.26 J	670	26	85	168	789		ND	7.25	8
		RMP POLISH D		5957^***					40						
2/25/13	13-1141	RMP EFFLUENT T	12	6632^	4.6	3.7	495	26	412	178		0.06	9.00	7.46	8
		RMP EFFLUENT D		6550^					32						

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-1139,L13-0001-1140,L13-0001-1141

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.03	0.38	2/26/13	
Copper	ug/L	ND	0.97	2/26/13	
Lead	ug/L	ND	2.7	2/26/13	
Zinc	ug/L	0.24	0.91	2/26/13	
Nickel	ug/L	ND	0.86	2/26/13	
Thallium	ug/L	0.38	1.86	2/26/13	
Iron	ug/L	ND	2.0	2/26/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	497	99%	85-115%	
Copper	ug/L	500	475	95%	85-115%	
Lead	ug/L	500	495	99%	85-115%	
Zinc	ug/L	500	501	100%	85-115%	
Nickel	ug/L	500	500	100%	85-115%	
Iron	ug/L	500	510	102%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-1139 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.13	500	500	468	474	94%	95%	75-125%	
Copper	ug/L	0	500	500	478	475	96%	95%	75-125%	
Lead	ug/L	0.03	500	500	475	479	95%	96%	75-125%	
Zinc	ug/L	81	500	500	555	565	95%	97%	75-125%	
Nickel	ug/L	10	500	500	489	500	96%	98%	75-125%	
Iron	ug/L	4.2	500	500	508	497	101%	99%	75-125%	

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Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-1139,L13-0001-1140,L13-0001-1141

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	0.5	5	2/27/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	100.6	101%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	101.6	102%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-1141

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	178.4	179.9	101%	85-115%	

pH SM4500-H+E	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.00	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	3.95	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.04	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	10.03	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	3.99	3.95-4.05	L12-0002-0048
Slope	98.9%	90-102%	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-1139,L13-0001-1140,L13-0001-1141

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/26/13	

MATRIX SPIKE SAMPLE
SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-1139	mg/l	7.7	4	11.4	93%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	5	4.4	88%	85-115	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2540D

ANALYSIS DESCRIPTION: 2540D Total suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-1139,L13-0001-1140,L13-0001-1141

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	2/26/13	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 13-1140

Parameter	Units	Results	Dup		Qual
Total Suspended Solids	mg/l	2	1		

LABORATORY CONTROL SAMPLE L13-0002-0005

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	4.5	90%	85-115	

LABORATORY CONTROL SAMPLE L13-0002-0005

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	4.5	90%	85-115	

The DOE RUN Company

Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL
TSS	JAA

Report Acceptance	
QAO	Date
GWP	2/28/2013
Manager	Date
EJS	2/28/2013

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample Date	Lab Number	Sample Name	Pb ug/l	Zn ug/l	Cu ug/l	Cd ug/l	Ni ug/l	Tl ug/l	Fe ug/l	Alka mg/l	S04 mg/l	P mg/l	TSS mg/l	pH mg/l	Turbidity FAU
2/27/13	13-1172	RMP ROUGH T	2.1 J	12780^	2.8	ND	844	27	1418	183	793			6.96	4
		RMP ROUGH D		12350^					1315						
2/27/13	13-1173	RMP POLISH T	2.9	10390^	0.54J	ND	778	27	263	179	807		ND	7.15	ND
		RMP POLISH D		10180^					249						
2/27/13	13-1174	RMP EFFLUENT T	7.2	10250^	2.7	0.38	704	27	252			0.07	31.0		12
		RMP EFFLUENT D		10420^***					124						

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34

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Quentin J. Schmidt Analytical Laboratory
43 Iron County Road No 1 Bldg 3
Viburnum, MO 65566
(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-1172,L13-0001-1173,L13-0001-1174

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/27/13	
Copper	ug/L	ND	0.97	2/27/13	
Lead	ug/L	ND	2.7	2/27/13	
Zinc	ug/L	0.47	0.91	2/27/13	
Nickel	ug/L	0.16	0.86	2/27/13	
Thallium	ug/L	0.82	1.86	2/27/13	
Iron	ug/L	ND	2.0	2/27/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	528	106%	85-115%	
Copper	ug/L	500	527	105%	85-115%	
Lead	ug/L	500	526	105%	85-115%	
Zinc	ug/L	500	535	107%	85-115%	
Nickel	ug/L	500	538	108%	85-115%	
Iron	ug/L	500	576	115%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-1172 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	603	595	121%	119%	75-125%	
Copper	ug/L	0	500	500	451	448	90%	90%	75-125%	
Lead	ug/L	10	500	500	534	530	105%	104%	75-125%	
Zinc	ug/L	127	500	500	732	722	121%	119%	75-125%	
Nickel	ug/L	11	500	500	527	519	103%	102%	75-125%	
Iron	ug/L	0	500	500	532	540	106%	108%	75-125%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Samples: L13-0001-1172,L13-0001-1173,L13-0001-1174

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity	mg/L	0.5	5	2/27/13	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	100.6	101%	85-115%	

LABORATORY CONTROL SAMPLE DUPLICATE

Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	101.6	102%	85-115%	

LABORATORY SAMPLE DUPLICATE 13-1172

Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	183.4	183.4	100%	85-115%	

pH SM4500-H+I	Results	QC Limits	Lab Standard Number
ICV Buffer 7.00	7.00	6.95-7.05	L11-0002-0121
ICV Buffer 4.00	3.95	3.95-4.05	L12-0002-0046
ICV Buffer 10.01	10.04	9.96-10.06	L12-0002-0047
CCV Buffer 10.0(	10.03	9.96-10.06	L11-0002-0122
CCV Buffer 4.05	3.99	3.95-4.05	L12-0002-0048
Slope	98.9%	90-102%	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-1172,L13-0001-1173,L13-0001-1174

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/28/13	

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual
Sulfate 13-1172	mg/l	7.9	4	11.5	90%	75-125	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/l	4	4	100%	85-115	

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QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water

Associated Lab Samples: L13-0001-1172,L13-0001-1173,L13-0001-1174

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	2/27/13	

LAB DUPLICATE

SAMPLE NUMBER / NAME: 13-1174

Parameter	Units	Results	Duplicate	Qual
Total Suspended Solids	mg/l	31	32	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	4	80%	85-115	

LABORATORY CONTROL SAMPLE

Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/l	5	6	120%	85-115	

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QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
B	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
G	Recommended sample preservation, extraction or analysis holding time was exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
K	Per client request, metals analysis was conducted less than 16 hours from sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

H Analysis conducted outside the EPA method holding time.

M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance	
QAO	Date
GWP	3/1/2013
Manager	Date
EJS	3/1/2013